PBEG05-62

Soil Properties and Stability of Puncak Setiawangsa and Bukit Aman Slope Failures, Kuala Lumpur, Malaysia

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Slope failures frequently occur in residual soil has negative impacts on human and the national economies. The purpose of the present study is therefore to investigate the characteristics of metasedimentary residual soil from the failed slope of Bukit Aman and adjacent slopes of Puncak Setiawangsa, to assess the stability of these slopes and to identify the causal factor contributing to the slope failures. The following tests for the index and mechanical properties were undertaken: particle size distribution, natural moisture content, Atterberg limits, specific gravity, x-ray diffraction (XRD) and Consolidated Isotropically Undrained Triaxial Tests (CIU). The results show that the main component of Puncak Setiawangsa and Bukit Aman residual soil is silt, followed by sand, clay and gravel. The range of soil moisture content for Puncak Setiawangsa is 10% to 35%, while for Bukit Aman is 15% to 35%. The plasticity index value of the residual soil from Puncak Setiawangsa is 26% to 67%, while for Bukit Aman is 37% to 68%. The range of specific gravity is 2.55 to 2.70 for Puncak Setiawangsa and 2.55 to 2.90 for Bukit Aman. The residual soil from Puncak Setiawangsa contains minerals quartz, alurgite, muscovite and kaolinite while for Bukit Aman, the minerals are quartz and kaolinite. The factor of safety for both slopes signified less than 1.5. the inherently unstable slopes, thus, effective slope remedial works were proposed for both locations. The landslides in these study areas may be attributed to a combination of several factors such as steep slope, lack of drainage system, erosion, presence of large trees and lack of ground anchors maintenance.

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 43, No. 3, July-September 2017